



GENERAL SPECIFICATIONS

Specifications

For additional information, refer to the John Deere Engine Manual.

Engine Type John Deere 8081, 8.1L

Number of Cylinders 6

Horsepower 337 HP at 2100 RPM

Aspiration Turbocharger and Air to Air Aftercooler

Oil Capacity 29.5 Liters (31 US Quarts)

Oil Filter Top Load Oil Filter

Coolant Capacity 62.5 Liters (16.5 US Gallons)

Coolant Additive Element Canister Type (Optional)

IMPORTANT: Do Not Mix Coolant Additive and Additive Elements or Use Together. Use Only One Method Exclusively.

Fuel Filters Primary: Spin-On/Spin-Off Element with Water .. Separator
Final: Spin-On/Spin-Off Element

Safety Shutoff Swing Out Door with Shutoff Override Control.

Electrical System 12 Volt Battery



GENERAL SPECIFICATIONS

John Deere 6081 Engine

Description

The John Deere 6081 engine has 8.1 L, six in-line cylinders, 337 HP, is turbocharged and after-cooled.

Preliminary Service Intervals

After the first 100 hours of operation, or after rebuilding your engine, do the following:

1. Change the engine oil and filter.
2. Change all fuel filters.

Every 250 hours of operation thereafter, do the following:

1. Change the engine oil and filter.
2. Change all fuel filters.

Refer to the Maintenance Section for complete service intervals.

Common Wear Parts

Primary Fuel Element	RE503676 (Washable Screen)
Final Fuel Element	RE509596
Oil Filter	RE509672
Belt (Crank Shaft)	R135604



TORQUE SPECIFICATIONS

The torque values listed in the following charts are for general use only. Do not use these values if a different torque value or tightening procedure is listed for a specific application.

Suggested Torque Values For Grades 5.6, 8.8, 10.9, 12.9 Zinc Plated Cap Screws

Nominal Diameter	Grade 5.6 Coarse		Grade 8.8 Coarse		Grade 10.9 Coarse		Grade 12.9 Coarse	
	Nm	ft-lb.	Nm	ft-lb.	Nm	ft-lb.	Nm	ft-lb.
M3	0.56	0.41	1.28	0.94	1.80	1.33	2.15	1.59
M4	1.28	0.94	2.90	2.14	4.10	3.02	4.95	3.65
M5	2.50	1.84	5.75	4.24	8.10	5.97	9.70	7.15
M6	4.30	3.10	9.90	7.30	14	10.30	16.50	12.10
M7	7.10	5.20	15.50	12.10	23	16.9	27	19.90
M8	10.50	7.70	24	17.70	34	25	40	29
M10	21	15	48	35	67	49	81	59
M12	36	26	83	61	117	86.2	140	103
M14	56	42	132	97	185	136	220	162
M16	88	64	200	147	285	210	340	250
M18	121	89	275	202	390	287	470	346
M20	171	126	390	287	550	405	660	486
M22	230	169	530	390	745	549	890	656
M24	295	217	675	497	960	708	1140	840
M27	435	320	995	733	1400	1032	1680	1239
M30	590	435	1350	995	1900	1401	2280	1681
M33	800	590	1830	1349	2580	1902	3090	2278
M36	1030	759	2360	1740	3310	2441	3980	2935
M39	1340	988	3050	2249	4290	3163	5450	3798

Suggested Torque Values For Grades 5.6, 8.8, 10.9, 12.9 Zinc Plated Cap Screws

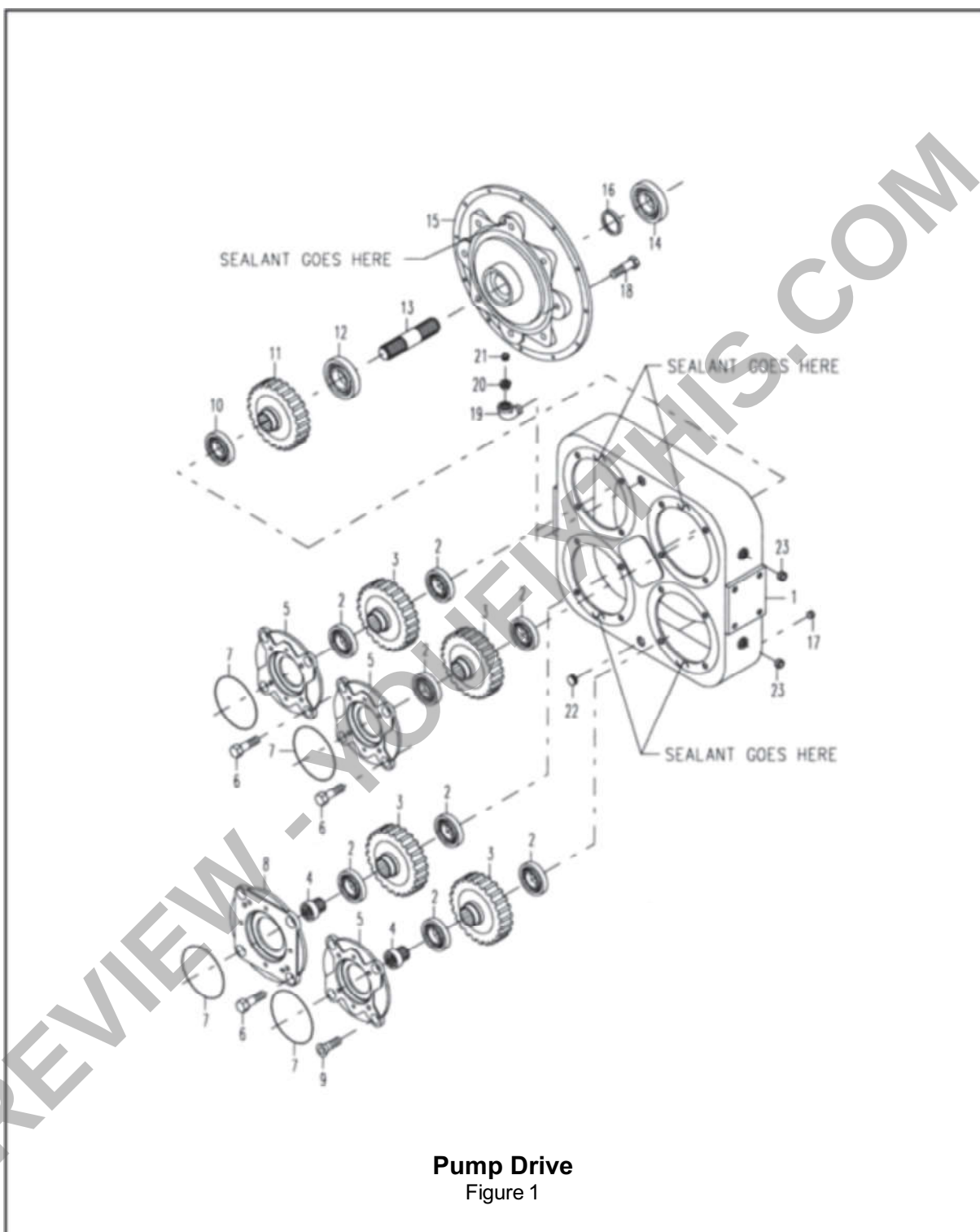
Nominal Diameter	Grade 5.6 Fine		Grade 8.8 Fine		Grade 10.9 Fine		Grade 12.9 Fine	
	Nm	ft-lb.	Nm	ft-lb.	Nm	ft-lb.	Nm	ft-lb.
M8 X 1	N/A	N/A	25	18	35	25	42	30
M10 X 1.25	N/A	N/A	49	36	68	50	82	60
M12 X 1.25	N/A	N/A	88	64	125	92	150	110
M14 X 1.5	N/A	N/A	140	103	195	143	235	173
M16 X 1.5	N/A	N/A	210	154	295	217	350	258
M18 X 1.5	N/A	N/A	305	224	425	313	510	376
M20 X 1.5	N/A	N/A	425	313	600	442	720	531
M22 X 1.5	N/A	N/A	570	420	800	590	960	708
M24 X 2	N/A	N/A	720	531	1000	737	1200	885

Torque for Grade 2 NC Weld Studs

1/4" Weld Studs 8 NM (6 Lb-Ft)
 3/8" Weld Studs 32 NM (25 Lb-Ft)
 1/2" Weld Studs 80 NM (60 Lb-Ft)



ENGINE



Pump Drive
Figure 1

- | | | |
|-------------------|------------------------------|--------------------|
| 1. Housing | 9. Bolt | 17. Plug-Oil Level |
| 2. Bearing Assy | 10. Bearing | 18. Bolt |
| 3. Gear-Pinion | 11. Gear | 19. Fitting |
| 4. Adapter-Spline | 12. Bearing-Input | 20. Fitting |
| 5. Adapter-Plate | 13. Shaft-Drive | 21. Breather |
| 6. Bolt | 14. Bearing | 22. Plug-Magnetic |
| 7. O-Ring | 15. Adapter-Flywheel Housing | 23. Plug |
| 8. Plate-Adapter | 16. Seal-Oil | |

0100-1



ENGINE

Pump Drive Removal

1. Close ball valve at the bottom section of the filter tank.

TRACK: Disconnect the ground drive suction tube.

WHEEL: Disconnect the suction tube to the multi-gear pumps.

2. Disconnect, label and cap all suction and pressure lines to the pumps. *Do Not* disconnect the engine drain lines.
3. Disconnect the control cables and electrical harness from the pumps.
4. Remove and cap all suction tubes from the housing to clear a work area.
5. To prevent contamination, make sure all hydraulic lines and ports are capped or plugged.
6. Loosen the four bolts located on each side of the engine flywheel housing. It is not necessary to fully remove these bolts.
7. To remove the load from the rear engine mounts, slightly lift the engine and pump drive. Block underneath the engine flywheel housing.
8. Support the pump drive and pumps as a single unit.
9. Remove the twelve bolts from the flywheel housing, located on the front of the pump drive.
10. Remove the four bolts, located on each side of the pump drive, that are securing the rear engine mount.
11. Carefully slide the pump drive backward, away from the engine. The coupling and drive shaft may stay with either the engine or the pump drive.
12. Inspect the pump drive and the driveshaft seal for damage. Discard and replace at assembly.
13. Inspect the eight bolts, located in the center of the drive coupling, for damage. Replace if necessary. Be sure the spline, located in the center of the rubber coupling, is fully bottomed on the shaft spline. Torque bolts to 50 Nm (37 Lb-Ft).
14. Install the pump drive shaft into the pump drive housing. Be careful not to damage the seal.

15. Install the pump drive onto the flywheel housing, by meshing the rubber coupling spline with the aluminum ring bolted to the engine flywheel. The pilot, located on the pump drive shaft, must go into the support bearing, located in the center of the flywheel.

Disassembly

1. Position the pump drive with the hydraulic pump adapter plates (5 & 8) facing upward. Remove o-rings (7 & 10), bolts (6 & 9) and adapter plates from pump drive housing (1).
2. Remove pumps.
3. Remove gears (3), splined adapters (4) and bearings (2) from the pump drive housing. This can be done by hand, since the bearings are slip-fitted to the housing and pump adapter bores. Bearings are press-fit to the gear hubs. It may be necessary to tip the gear slightly, in order to clear the pinion gear bearing pocket.
4. After all gears and their bearings have been removed, remove the breather parts (19, 20 & 21) and turn the gear box over so that adapter housing (15) is facing upward. Remove eight bolts (18) and lift the adapter housing from the pump drive housing. Remove pinion gear (11) and bearings (2 & 12).
5. Remove bearings (2 & 12) from the hubs of gears (3 & 11), using a gear puller or arbor press.
6. Remove oil seal (16) by driving outward, toward the engine side of the adapter housing.



STEERING SYSTEM

Troubleshooting

Most steering problems can be corrected if the problem is properly defined. The entire steering system should be evaluated before removing any components. Usually the steering control valve is not the cause of most problems. The following, is a list of steering problems and their possible cause along with suggested corrections arrowed directly underneath.

Slow Steering, Hard Steering, Or Loss Of Power Assist:

1. Worn or malfunctioning pump.
 - Repair or replace pump.
2. Stuck flow divider piston.
 - Repair or replace flow divider.
3. Worn pump compensator (allows the system pressure to be less than specified).
 - Repair or replace compensator or pump.
4. Malfunctioning relief valve (allows the system pressure to be less than specified).
 - Repair or replace the relief valve.
5. Overloaded steering axle.
 - Reduce load.
6. Leaking or kinked supply line for load sensor.
 - Trace line and tighten fittings or replace hose.
7. Malfunctioning priority valve.
 - Check for sticking spring or spool
 - Check damping orifices in both ends of main bore for debris.
 - Check system pressure at SCU inlet for proper pressure, if incorrect: replace priority valve relief cartridge.

Wander—The Tendency To Deviate From Operator Directed Course:

1. Air in system due to low oil level, cavitating pump, loose fittings, kinked hose, etc.
 - Check system for the above and add system fluid to correct.†
2. Worn mechanical linkage.
 - Repair or replace.
3. Binding of linkage or cylinder rod.
 - Repair or replace.
4. Loose cylinder piston.
 - Repair or replace.
5. Leaking crossover relief or anticavitation valve in cylinder lines.
 - Repair or replace.
6. Severe wear in steering valve.
 - Repair or replace.

Drift—The Tendency To Deviate From Non-Operator Directed Course:

1. Single rod end cylinder slowly extends without turning the steering wheel.
 - A small rate of extension may be normal on a closed center system.
2. Worn or damaged steering linkage.
 - Repair or replace linkage and align front end.

Slip—When A Slow Movement Of Steering Wheel Fails To Cause Any Movement Of Steered Wheels:

1. Leakage of cylinder piston seals or accessory valve between cylinder lines or ports.
 - Replace seals, repair or replace accessory valve.
2. Worn steering valve gerotor.
 - Repair or replace steering valve.

† Foam on top of the oil in the tank is usually a sign of air in the system.

CH3500 Harvester Repair Manual

CAMECO®

Table of Contents

GENERAL SPECIFICATIONS

Specifications	0001-1
John Deere 6081 Engine	0001-2
Description	0001-2
Preliminary Service Intervals	0001-2
Common Wear Parts	0001-2

GENERAL CAPACITIES

Harvester Capacities	0002-1
Tire Inflation Pressure	0002-1

TORQUE SPECIFICATIONS

Suggested Torque Values For Grades 5.6, 8.8, 10.9, 12.9 Zinc Plated Cap Screws	0003-1
Suggested Torque Values For Grades 5.6, 8.8, 10.9, 12.9 Zinc Plated Cap Screws	0003-1
Torque for Grade 2 NC Weld Studs	0003-1
Suggested Torque Values And Clamp Loads For Grades 2, 5 & 8 Cap Screws	0003-2
Grade or Property Class Head Marking for SI Bolts	0003-2
Conversion Factors	0003-2

FLUID RECOMMENDATIONS

John Deere Engine Coolant Requirements† ..	0004-1
John Deere Prediluted Antifreeze/ Summer Coolant	0004-1
John Deere Cool-Gard	0004-1
John Deere Antifreeze/Summer Coolant Concentrate	0004-1
John Deere Antifreeze/Summer Coolant	0004-1
Hydraulic Fluid	0004-2
Diesel Fuel	0004-2
Engine Break-in Oil (John Deere)	0004-2
Diesel Engine Oil	0004-3
Gear Oil—Pump Drive, Chopper Box and Basecutter	0004-3
Gear Oil—Final Drive	0004-3
Grease	0004-3

GENERAL INFORMATION

Straight O-Ring Boss Fittings	0005-1
Angled O-Ring Boss Fittings	0005-1
37° Flare Cone Fittings	0005-1
Hex Flats Recommended Rotation	0005-2
Four Bolt Flange Fittings	0005-2
Flange Metric Bolt Torque Chart	0005-3
Flange SAE Bolt Torque Chart	0005-3
Conversions	0005-4
Weight Measure	0005-4
Length Measure	0005-4
Metric (SI†) Measurements	0005-4
Metric to English	0005-4
English to Metric	0005-4
Multiplication Factors	0005-5
Temperature Conversion Chart	0005-5
Conversion Formulas	0005-5
Recommended Supplies	0005-6
Hydraulic Gauge Kit	0005-8
CH3500 Specialty Tools and Part Numbers ..	0005-9

SERVICE POINTS

Harvester Component Locations	0006-1
Harvester Service Point Locations	0006-2
Harvester Grease Point Locations	0006-3
Grease Point Locations	0006-4

ENGINE

Pump Drive	0100-1
Pump Drive Removal	0100-2
Disassembly	0100-2
Clean and Inspect	0100-3
Assembly	0100-3

OPERATOR'S STATION

Other Material	0200-1
Remove and Install Cab Windshield	0200-1
Remove and Install Cab Roof	0200-4
Remove and Install Instructional Seat	0200-6
Cab Door Latch Striker	0200-8



Flange Side Wear	0700-15
Idlers Percentage Worn Chart	0700-15
Track Shoe Problems	0700-16
Grouser Wear Measurement	0700-16
Wear Limits—Service and Destruction	0700-16
Grouser Wear	0700-16
Plate Wear and Leading/Trailing Edge Wear	0700-17
Bolt Hole Wallowing Out	0700-17
Self-Locking Track Nut	0700-17
Sprocket Chain Roller Alignment	0700-18
Wheel Assembly	0700-19
Wheel Assembly	0700-20
Remove And Replace Front Wheel Bearings	0700-20
Suggested Tools	0700-20
Remove Rear Wheel Assembly	0700-20
To Remove And Mount Tire Onto Wheel Assembly	0700-20
Install Wheel Assembly	0700-21
Tire Pressure Specifications	0700-21

MAIN HYDRAULIC SYSTEM

Multiple Gear Pump	2000-1
World Multiple Gear Pump	2000-2
World Multiple Gear Pump (Piggyback)	2000-3
Multiple Gear Pump Repair	2000-4
Suggested Tools	2000-4
Repair Precautions	2000-4
Bushing Removal Tool	2000-4
Seal Removal Tool	2000-4
Bushing Installation Tool	2000-4
Special Steel Sleeve	2000-4
Seal Installation Tool	2000-5
Disassembly	2000-5
Clean and Inspect	2000-5
Assembly	2000-6
Start Up Procedure	2000-7
Recommended Test Procedure	2000-7
Suggested Tools	2000-10
External Relief Settings	2000-10
Overhaul	2000-10
Valve Bank Disassembly	2000-10
Front and Rear Feed Roller Valves	2000-11
Assembly Procedure	2000-12
Track Fixed Displacement Motor	2000-14
Seal Replacement	2000-14
Disassembly	2000-15
Clean and Inspect	2000-15
Assembly	2000-15

STEERING SYSTEM

Relief Valve Adjustment	2100-1
Relief Valve Repair	2100-1
Priority Valve	2100-1
Disassembly/Reassembly	2100-4
Troubleshooting	2100-6

Steering Linkage	2100-8
Remove and Install Steering Cylinder	2100-9
Repair Steering Cylinder	2100-10
Check Front Axle Toe-In	2100-12
Adjust Front Axle Toe-In	2100-13

TOPPER SYSTEM

Collector, Crop Divider, Feed Roller, and Elevator Motor	3000-2
Suggested Tools	3000-3
Collector Motor	3000-3
Disassembly	3000-3
Clean and Inspect	3000-4
Assembly	3000-5
Topper	3000-6
Topper Repair	3000-7
Collector Drum and Motor Removal	3000-7
Topper Assembly Removal	3000-7
Clean and Inspect	3000-7
Drum and Topper Assembly	3000-7
Shredder Topper	3000-8
Topper Repair	3000-9
Collector Drum and Motor Removal	3000-9
Topper Assembly Removal	3000-9
Clean and Inspect	3000-9
Drum and Topper Assembly	3000-10
Scroll Cylinder	3000-11
Suggested Tools	3000-12
Disassembly	3000-12
Clean And Inspect	3000-12
Assembly	3000-13
Topper Lift	3000-14
Disassemble and Assemble Topper Lift Cylinder	3000-14
Gear Motor	3000-16
Gear Motor Repair	3000-17
Suggested Tools	3000-17
Repair Precautions	3000-17
Bushing Removal Tool	3000-17
Seal Removal Tool	3000-17
Bushing Installation Tool	3000-17
Disassembly	3000-18
Clean And Inspect	3000-18
Assembly	3000-19
Start Up Procedure	3000-20
Recommended Test Procedure	3000-20

CROP DIVIDER SYSTEM

Crop Divider	3100-1
Crop Divider Removal	3100-2
Disassembly	3100-2
Clean and Inspect	3100-2
Assembly	3100-2
Crop Divider Shoe Assembly	3100-2
Crop Divider Shoe Removal	3100-2



HYDROSTATIC TRANSMISSION

Reconditioning and Replacement of Bearing Plate, Valve Segment, and Cylinder Block

Inspect the running (bronze) surface of the bearing plate (1) for damage and excessive wear. The sealing surfaces must be free from scratches and nicks. The locating pinholes must not be worn.

Inspect valve segment (2) for damage or wear on the sealing surfaces. Inspect the spindle for wear.

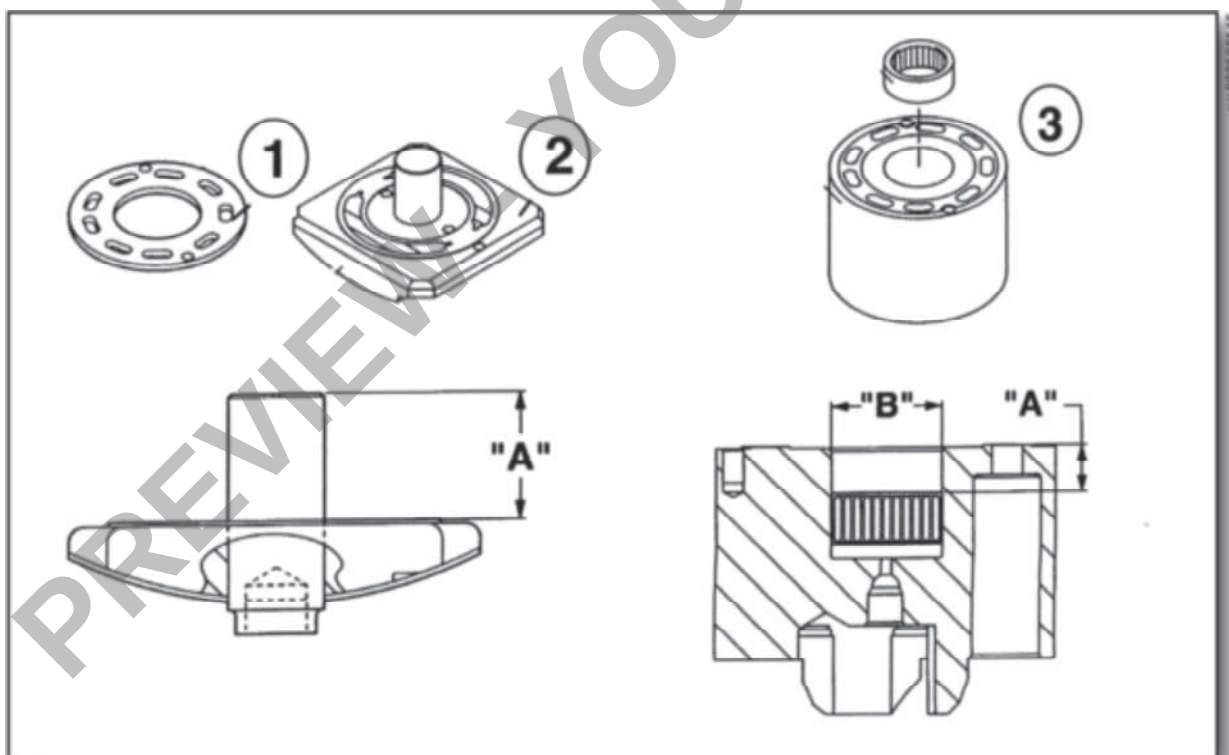
Check the spindle in the valve segment by measuring distance A. If the dimension is not within 1.28" (32.6 mm) to 1.29" (32.8 mm), it indicates that the spindle has moved in the valve segment and the assembly must be replaced.

Inspect the cylinder block assembly for wear or damage. The bearing plate must be free from scratches or nicks, and the holes for the bearing plate locating pins must not be worn. The races for the synchronizing shaft rollers must not be worn.

Inspect the cylinder block bearing (3). If it requires replacement, remove the bearing using a suitable puller.

IMPORTANT: Do not damage the bearing plate surface of the cylinder block.

Press the new bearing into the cylinder block using a suitable press pin. Press the bearing into the cylinder block until it is located the proper distance below the plate surface. Distance B should be 1.101" (27.97 mm), and distance C should be 0.46" $\pm$ 0.01" (11.75 $\pm$ 0.25 mm).





WHEEL AND TRACK

Track Roller Percentage Worn

Inches	mm	% Worn
8.00	203.00	0.00
7.98	202.50	4.00
7.96	202.00	8.00
7.94	201.50	12.00
7.92	201.00	16.00
7.90	200.50	20.00
7.88	200.00	24.00
7.86	199.50	28.00
7.84	199.00	31.00
7.82	198.50	34.00
7.80	198.00	37.00
7.78	197.50	40.00
7.76	197.00	43.00
7.74	196.50	46.00
7.72	196.00	49.00
7.70	195.50	52.00
7.68	195.00	55.00
7.66	194.50	58.00
7.64	194.00	61.00
7.62	193.50	64.00
7.60	193.00	67.00
7.58	192.50	70.00
7.56	192.00	73.00
7.54	191.50	76.00
7.52	191.00	79.00
7.50	190.50	82.00
7.48	190.00	85.00
7.46	189.50	88.00
7.44	189.00	91.00
7.42	188.50	94.00
7.40	188.00	97.00
7.38	187.50	100.00
7.36	187.00	103.00
7.34	186.50	106.00
7.32	186.00	109.00
7.30	185.50	112.00
7.28	185.00	115.00
7.26	184.50	118.00
7.24	184.00	121.00

ROLLING UNDERCARRIAGE

Flange To Boss Measurement

If the track roller guards make the pin-boss-to-roller-flange measurement difficult to obtain, you can acquire it by subtracting the link wear plus the roller wear, from the clearance, when the parts are new.

For example, if the clearance is 17.2 mm (0.69"), the roller radius wear is 3.8 mm (0.15") and the link wear is 4.6 mm (0.18"):

$$\begin{aligned}
 \text{Pin Boss Clearance} &= 17.5 \text{ mm} - (3.8 + 4.6) \\
 &= 17.5 \text{ mm} - 8.4 \text{ mm} \\
 &= 9.1 \text{ mm}
 \end{aligned}$$

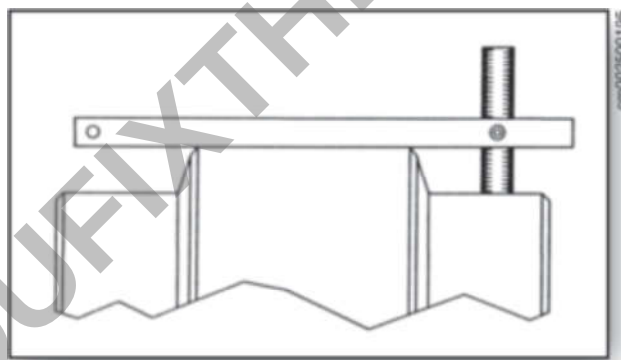


Figure 16

Idler Tread Wear Measurement

Tread wear is the only measurable wear location on the idler. Tread wear is determined by measuring, with a broad based depth gauge, from the idler center flange to the tread surface. The depth gauge should be positioned so that the ruler is aimed, as closely as possible, toward the center of the idler. The ruler's base should be flat on the center flange and parallel to the idler shaft. The greatest error in measuring idler wear is caused by any wear located on top of the center flange, this alters the reference point. Abrasive packing conditions usually cause the greatest amount of center flange wear. If this wear is suspected, some attempt to compensate should be made when the reading is taken. Remember, idler tread wear occurs and decreases as center flange wear occurs.

Swapping Idlers

Idlers can be swapped from one side to the other, in order to balance wear. Swapping is best when the ratio of most worn to least worn is greater than 1.5 to 1 and the average percentage worn is less than 60%.



TOPPER SYSTEM

Suggested Tools

1. Vise
2. Spanner Wrench—0840030555
3. 7/32 In Hex (Allen) Wrench (included in wrench set 0840021409)
4. Non-Flammable Solvent
5. Rod Seal Kits
6. Scroll Lift Cylinder—0610053967
7. Topper Lift Cylinder—0610053968
8. Tube Seal Kit—0610053972
9. Loctite 271—0841303179
10. Antiseize Compound—0841305658
11. Loctite Primer-N—0841303194

Disassembly

Refer to Figure 1.

⚠ CAUTION ⚠

**Before removing cylinder for repair,
Relieve All System Pressure.**

1. Loosen setscrew (8) in locking collar (7).
2. Using spanner wrench (0840030555), loosen locking collar (7) on cylinder tube assembly (1).
3. Very carefully pull rod assembly (9) along with locking collar (7), head (6) and piston (5) from tube assembly (1)†.
4. Remove bolt (3) and washer (4). It may be necessary to apply heat in order to remove the bolt, since it was installed with Loctite.
5. Remove piston (5), head (6), and collar (7) from rod assembly (9).

Clean And Inspect

⚠ CAUTION ⚠

Do Not use a flammable solvent to clean cylinder parts. An explosion may occur inside the cylinder, at the moment of pressurization, if just a tiny drop of any flammable solvent is trapped inside of a confined cylinder area.

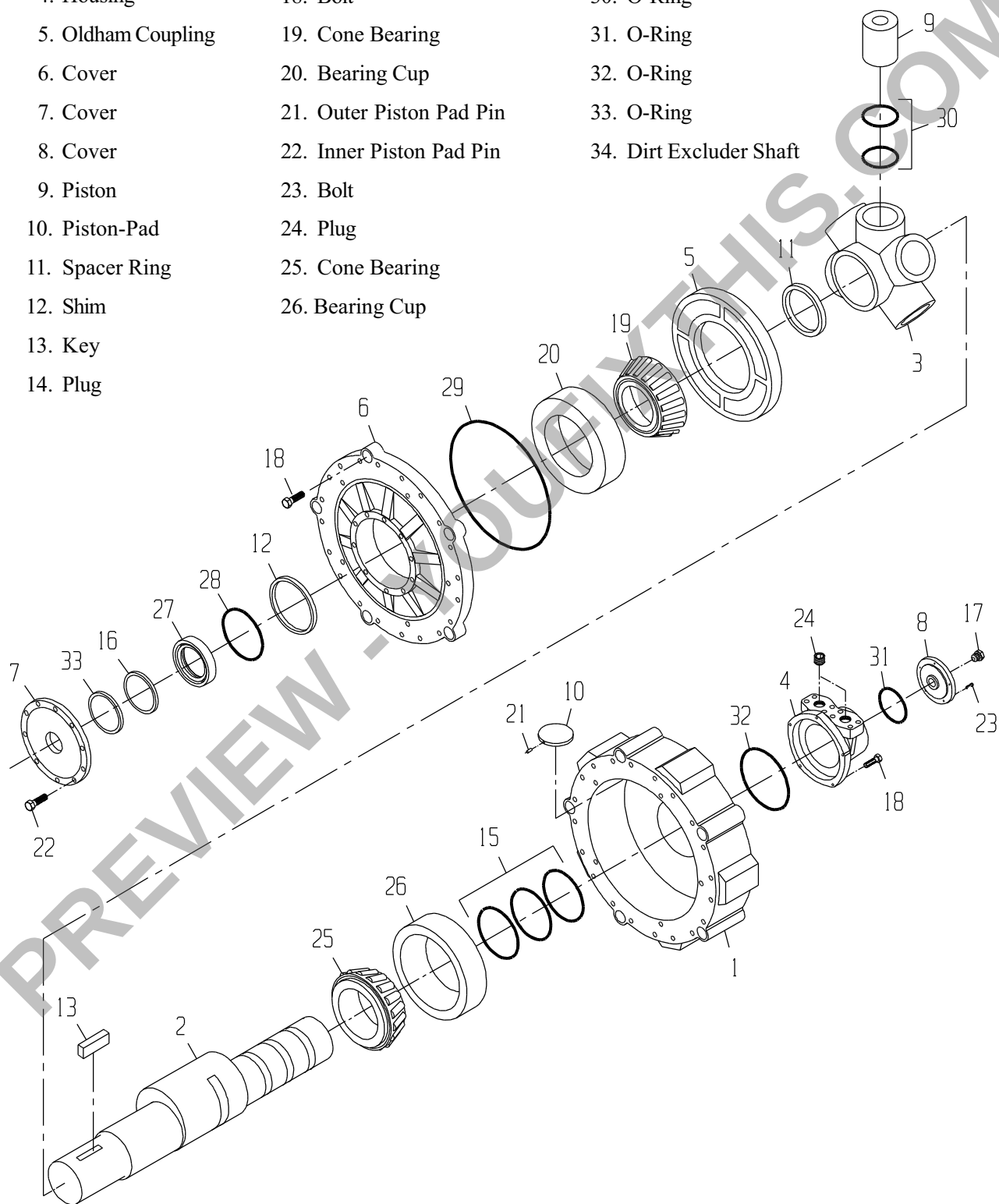
1. All parts must be thoroughly cleaned, and kept clean during inspection and assembly. Use a nonflammable solvent to clean and compressed air to dry. If using air, make sure it is filtered to remove all contamination and water.
2. Remove the cured Loctite from the internal threads of the cylinder rod. Run a tap into the rod end.
3. Using a wire brush, remove the cured Loctite from the threads of the bolt.
4. Clean and inspect threads of the locking collar.
5. Inspect the rod for scratches or nicks. Check the inside of the tube assembly for scratches or scoring. Replace if necessary.
6. Remove and discard all seals and o-rings. CAMECO recommends all seals and o-rings be replaced at assembly.
7. Inspect, both internally and externally, the head and piston for scoring or excessive wear. Replace if necessary.

† Be careful, **Do Not** score or scratch the inside of the tube.



CHOPPER SYSTEM

- | | | |
|--------------------|-----------------------------|-------------------------|
| 1. Housing | 15. Distributor Piston Ring | 27. Seal |
| 2. Shaft | 16. Backup Washer | 28. O-Ring |
| 3. Cylinder Block | 17. Fitting | 29. O-Ring |
| 4. Housing | 18. Bolt | 30. O-Ring |
| 5. Oldham Coupling | 19. Cone Bearing | 31. O-Ring |
| 6. Cover | 20. Bearing Cup | 32. O-Ring |
| 7. Cover | 21. Outer Piston Pad Pin | 33. O-Ring |
| 8. Cover | 22. Inner Piston Pad Pin | 34. Dirt Excluder Shaft |
| 9. Piston | 23. Bolt | |
| 10. Piston-Pad | 24. Plug | |
| 11. Spacer Ring | 25. Cone Bearing | |
| 12. Shim | 26. Bearing Cup | |
| 13. Key | | |
| 14. Plug | | |



3600-12

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